AMPLIFIED ENGINEERING

FATBOX B.A.S.E MANUAL

VERSION 1.2

CONTENTS

Our motto 4

What's in the Box? 5

Important Safety Notice 6

1. Product Specifications 7

2. System Requirements

- 2.1 Power Supply Details 8
- 2.2 Cellular Data Network Provider 8
- 2.3 Ethernet Devices 9
- 2.4 Serial Devices 9

3. FATBOX Hardware 10

4. FATBOX Dimensions and Installation 13

5. Hooking Up the FATBOX to Devices

- 5.1 Ethernet Devices Settings
  - 5.1.1 Using the DHCP 14
  - 5.1.2 Setting Hosts manually 14
- 5.2 Serial Device Settings 15

6. Logging in & Saving Changes (via the Web Console)

- 6.1 Logging In to the FATBOX 16
- 6.2 Saving Changes Made 16

7. Working the Web Console

- 7.1 System Parameters
  - 7.1.1 Application Configure 17
  - 7.1.2 Services Configuration 19
  - 7.1.3 Ethernet Configure 20
  - 7.1.4 Serial Configure 22
  - 7.1.5 Timer Configure 23
  - 7.1.6 Timer Up Down 23
  - 7.1.7 Reboot Redial Conditions 24
  - 7.1.8 Advanced Parameters 24
  - 7.1.9 AT over Ethernet 25
  - 7.1.10 Backup Routing 26
- 7.2 Network Configuration
  - 7.2.1 NAT 27
  - 7.2.2 Ifconfig 28
  - 7.2.3 Static Route 29
  - 7.2.4 AutoPing 29
  - 7.2.5 DHCP 29
  - 7.2.6 DDNS 30
  - 7.2.7 NTP 30

7.2.8 PPTP 31
7.2.9 L2TP 32
7.2.10 IPSEC 33
7.2.11 VRRP 33
7.2.12 VLAN 34
7.3 Security Configure 35
7.4 System Manage
7.4.1 System Tools 37
7.4.2 User Manage 38
7.4.3 Device Status 38
8. Connecting via TELNET - Settings & Configurations
8.1 Logging In 39
8.2 Cellular Operator Settings 39
9. Configurations via the Serial Port
9.1 Logging in via the Serial Port 40
9.2 Serial Console Commands 40
9.3 Reverting to Factory Default
9.3.1 The RESET Button 41
9.3.2 Via Web Browser 41
9.3.3 Via the Serial Port 41
10. Contacting Us at Amplified Engineering 42

COLOR LEGEND

This manual is color-coded for your ease of reference.

normal text

actions

product specs

windows commands

web console headers

table info

critical!

AMPLIFIED ENGINEERING

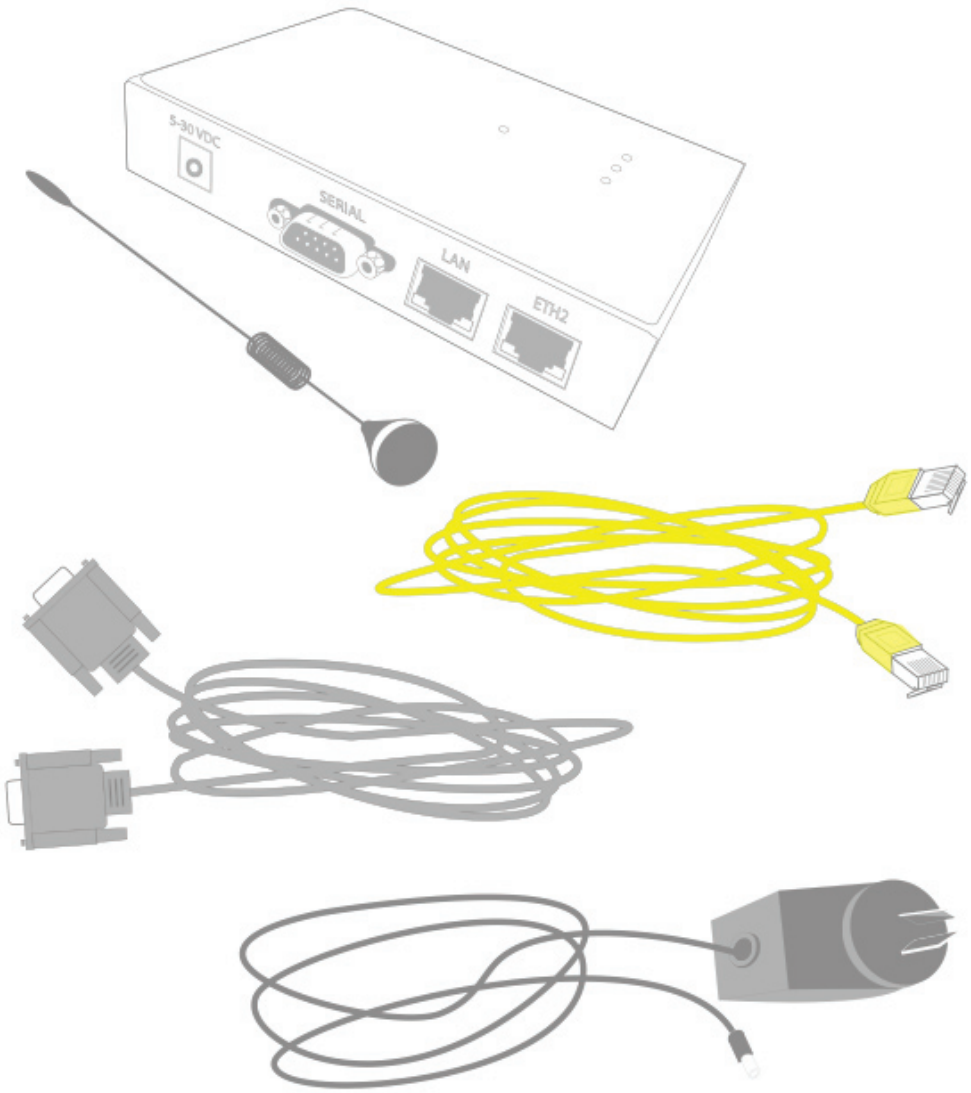
Delivering Optimized Wireless Solutions is our motto.

If you have any help requirements, please do not hesitate to contact our Solution Partners or the FATBOX Head Office ;)

CONTACT DETAILS ON PAGE 42.

Please download latest user manuals at www.amplified.com.au

Thank you for purchasing the FATBOX B.A.S.E. HSUPA broadband cellular router. Inside your FATBOX packaging, you will find:



- 1 X FATBOX™ B.A.S.E. HSUPA Router
- 1 X Tuned GSM antenna (with 2M wire)
- 1 X Yellow CAT5 LAN cable
- 1 X Serial diagnostics cable
- 1 X Appropriate power supply unit (12VDC output)

▷ IMPORTANT SAFETY NOTICE

All specialist electronic devices must be operated with due care to avoid damage or injuries and should be installed and operated by a trained personnel.

DO NOT OPERATE THIS EQUIPMENT IN ENVIRONMENTS CONTAINING POTENTIALLY EXPLOSIVE GASES OR LIQUIDS, EXAMPLE, GAS STATIONS AND CHEMICAL PLANTS AND EXPLOSIVE STORES.

1. PRODUCT SPECIFICATIONS

The FATBOX B.A.S.E integrates an M2M-rated HSUPA (+GSM) module with an efficient ARM7 processor and runs a multi-function firmware in Linux OS. Its rugged industrial design is fit for demanding remote and mobile data connectivity applications.

Wireless Cellular Interface

- HSUPA for 7.2Mbps download and 3.6Mbps upload over 850/900/1900/2100MHz bands
- GSM 850/900/1800/1900 for GPRS/EDGE
- SMS and CSD 14.4kbps supported
- RX Diversity antenna support for mobile applications

LAN Interface

- 2 x 10/100BaseT Ethernet ports
- DHCP as default
- VLAN supported

Serial Interface

- To operate as serial modem (e.g. for SMS, CSD)
- For TCP/UDP transparent transport mode
- As a back-up route (e.g. to serial SAT modem)

Power and Operating Conditions

- Power: 5 – 30VDC (200mA~150mA 12VDC)
- Operating Temperature: -20°C to +65°C
- Physical dimensions: 130mm x 92mm x 25mm
- Weight: 400gm

Operating System

- LINUX OS on ARM microprocessor
- Kernel and Firmware update over TCP or Serial

Other Features

- Automatic WAN/ADSL backup to HSUPA
- Wake on LAN/Serial data
- Wake on LAN/Serial call
- SMS to reboot FATBOX B.A.S.E remotely
- AT over Ethernet for sending SMS or to manage device locally
- SNMPv1 for Network Management Systems
- Supports VPN [IPSEC (PSK), PPTP and L2TP]
- DDNS
- DMZ & NAT
- IP Firewall
- VRRP (Virtual Router Redundancy Protocol)
- Configurable PPP keep alive function
- Backup route using serial to external modem

In the Box

- FATBOX B.A.S.E HSUPA Router
- GSM antenna (with 2 meter wire)
- CAT5 LAN cable
- Serial cable
- Power supply unit (12VDC)

2.1 Power Supply Details

The power requirements for the B.A.S.E are as following:

Supply	5 – 30VDC regulated power supply recommended (e.g. 12VDC @ 1A)
Consumption	100 ~ 150mA @ 12 VDC (Cellular network not connected) 200 ~ 250mA @ 12VDC (Cellular network connected and transmitting)

- ▷ Inadequate current or dips in voltage may cause the device to fail to connect to data services even if the LEDs are lighted up.
- ▷ Supply over 30 VDC will damage the device.

2.2 Cellular Data Network Provider

The FATBOX B.A.S.E is designed to be a reliable broadband cellular device that is able to operate in the following frequencies:

Frequency Bands	UMTS: Quad Band 850/900/1900/2100MHz HSUPA/HSDPA: 850/900/1900/2100MHz GSM/GPRS/EDGE: Quad Band 850/900/1800/1900MHz
Output Power	Class 4 (+33dBm ± 2dB) for EGSM/GPRS 850 Class 4 (+33dBm ± 2dB) for EGSM/GPRS 900 Class 1 (+30dBm ± 2dB) for GSM/GPRS 1800 Class 1 (+30dBm ± 2dB) for GSM/GPRS 1900 Class 3 (+24dBm +1/-3dB) for UMTS 2100, WCDMA FDD BdI Class 3 (+24dBm +1/-3dB) for UMTS 1900, WCDMA FDD BdII Class 3 (+24dBm +1/-3dB) for UMTS 900, WCDMA FDD BdVIII Class 3 (+24dBm +1/-3dB) for UMTS 850, WCDMA FDD BdV

- ▷ Please ensure that the SIM card to be used has PIN disable and HSUPA, EGPRS or GPRS data plans enabled. You will need to check with your Network Operator for configuration information like APN, dial-number, username and password.

2.3 Ethernet Devices

In the factory default, the B.A.S.E has two IP addresses. The respective IP address for the Ethernet ports are as follows:

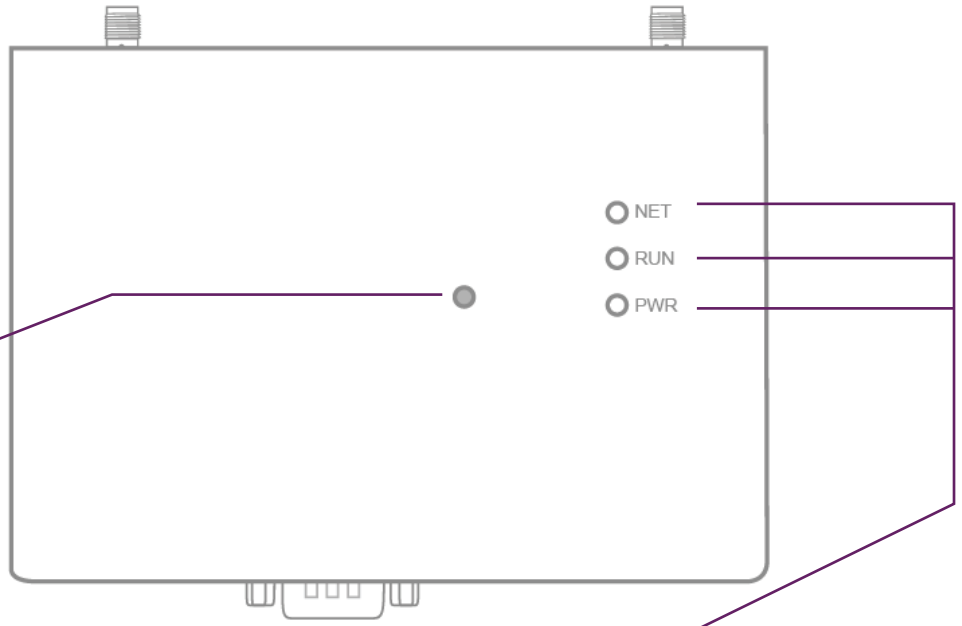
PORT	IP ADDRESS	SUBNET MASK
LAN	192.168.1.1	255.255.255.0
ETH2	138.0.19.1	255.255.255.0

You can either let the inbuilt DHCP server assign IP addresses to connected devices automatically (by default) or configure the attached hosts with fixed IP addresses. See Section 5.1.2 on page 14 for more information on how to do this.

2.4 Serial Devices

In the factory default, the B.A.S.E's serial port is designated as a serial terminal console that continuously sends a debug log. This helps to ease device troubleshooting.

But the serial port can also be configured to function as a serial modem, back up route or a TCP/UDP transparent transport channel. See section 7.1.4 on page 22 for information on how to do this.



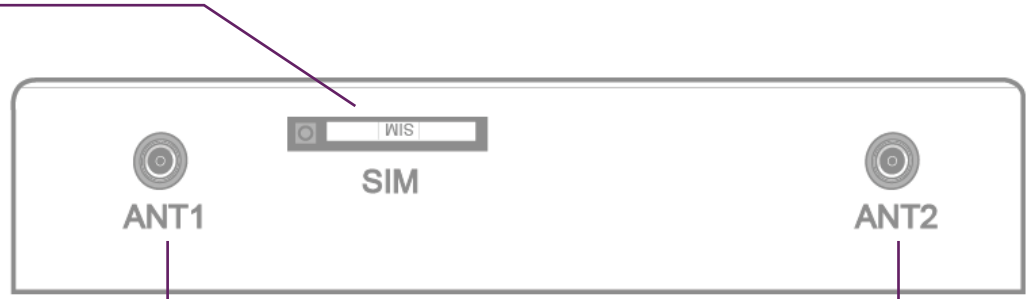
(I) Hardware RESET

Press 1 – 9 Seconds	Soft Reset
Press >10 Seconds	Revert configuration to Factory Settings

(II) LED Indicators

The FATBOX B.A.S.E LEDs are useful indicators of the unit's current operating status and should be used for initial setup and troubleshooting of the router.

LED	Indication of	LED Status	Router Status
PWR	Power Supply	LED ON	Power is supplied to router
RUN	Startup Stage	Flash Once every 3 Seconds	Router Initializing
		Flash Twice every 3 Seconds	Router failing Initialization
	Network Connection	Flash Once every 1 Second	PPP dialing
		LED ON	PPP online
		LED OFF	PPP offline
NET	Network Type	GREEN	2G (GPRS/EDGE) network
		RED	3G/HSDPA network
	Signal Strength	ON	Signal is strong
		Flash Once every 3 Seconds	Signal is normal
		Flash Twice every 3 Seconds	Signal is weak



(III) SIM Card (or USIM)

The SIM card to be used is the 'mini' USIM type of ISO/IEC 7810:2003, ID-000 standard, i.e. 25 X 15mm. Push gently the yellow button to eject SIM carrier. SIM card should be inserted into the carrier as indicated.

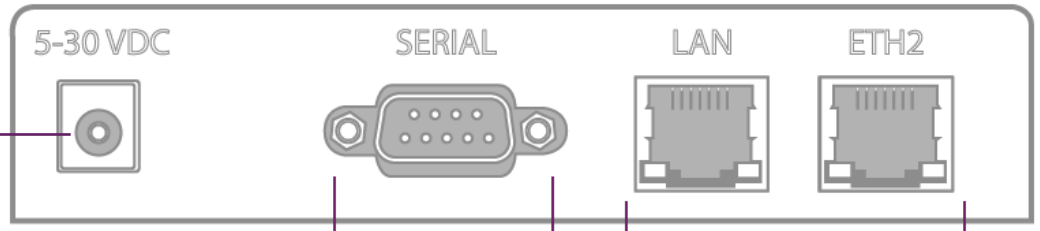
▷ NEVER remove or insert SIM card when device has PWR switched in "ON" position. Damage caused to device or SIM in such case will not be warranted.

(IV) Antenna (ANT1 & ANT2)

The supported antenna is a 50Ω SMA Male. This antenna must be designed for the network frequency that the device is operating in. For normal uses set up the antenna on the ANT1 slot. ANT2 is a RX Diversity antenna connection, adding it will give the router better HSUPA downlink data performance in mobile applications.

Please contact support@amplified.com.au or a reseller partner if you need to utilize the RX diversity antenna or purchase a specialized antenna such as a high gain or outdoor antenna.

Note: The performances of the device, especially for HSUPA operations, are very much affected by the signal strength of the network operator.



(V) Power Source (DC)

If you are providing your own power source, please ensure it adheres to the following specifications:

Power Connector:

Female 5.5mm X 2.1mm plug is required

(+VE TIP)

A 12VDC with 1A rated regulated power supply is recommended for maximum power efficiency.

(VI) Serial Ports (SERIAL)

The serial port is useful for the manipulations of B.A.S.E units remotely. The port may also be used as a serial modem, the configuration to set the B.A.S.E as a serial modem is on page 22, section 7.1.4.

(VII) Ethernet Ports

The B.A.S.E has two 10/100BaseT Auto-Negotiation Ethernet ports.

(i) For normal applications with only a single host, LAN should be used.

(ii) In “WAN to HSUPA backup” applications, ETH2 is connected to the network’s WAN modem (e.g. a DSL/ADSL modem)

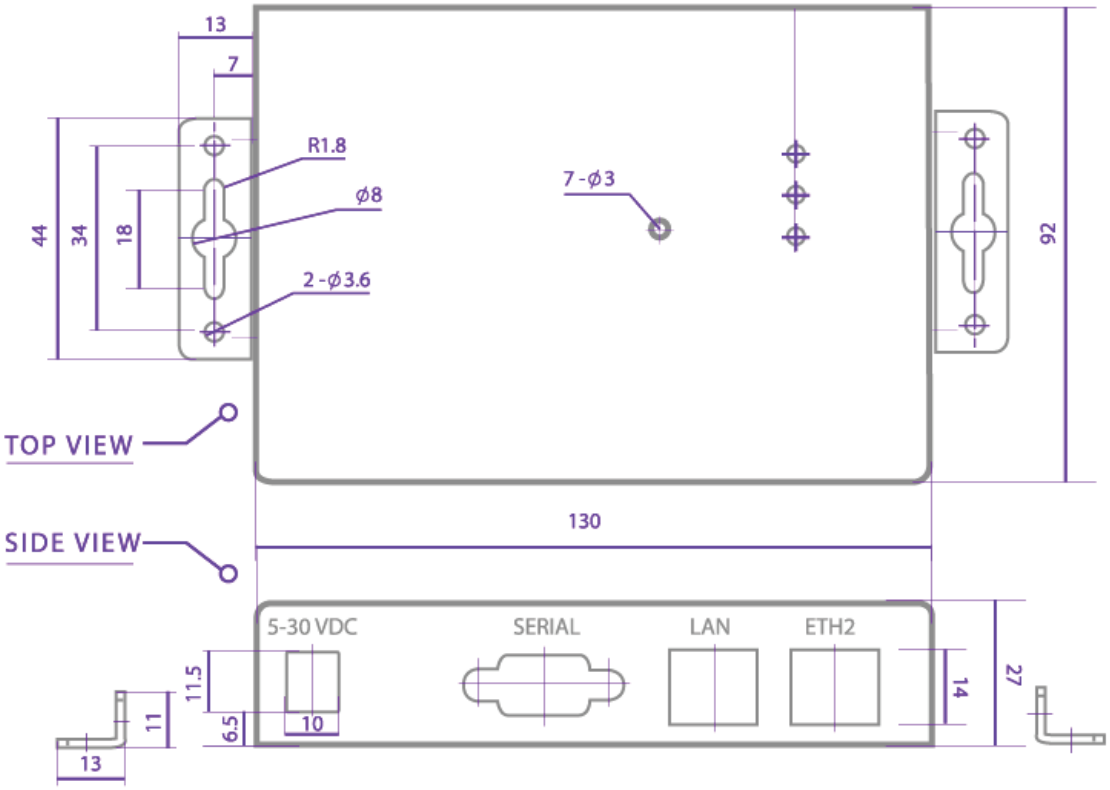
Note: The maximum Ethernet cable length is 100 meters.

The case of the B.A.S.E is made with sheet steel that provides sturdy protection for the electronics and serves as an EMR Shield at the same time. The removable “L” mounting plates should be used to mount the router to a secure structure or a mounting plate within an electronic enclosure.

∴ Installation Orientation: For most efficient cooling, the router should be mounted vertically with the antenna-side facing up to allow for natural convection.

∴ Antennas must be mounted external of any shielded metal enclosure and secured to a large metal plane for best performance. A good example is the middle of a vehicle’s metal roof.

∴ Vibration – in conditions where strong vibrations are expected (for example in locomotives) the FATBOX should be mounted with a vibration dampening material in between the box and the mounting surface. This isolation helps to dampen the transmission of shocks that may otherwise damage the device over time.

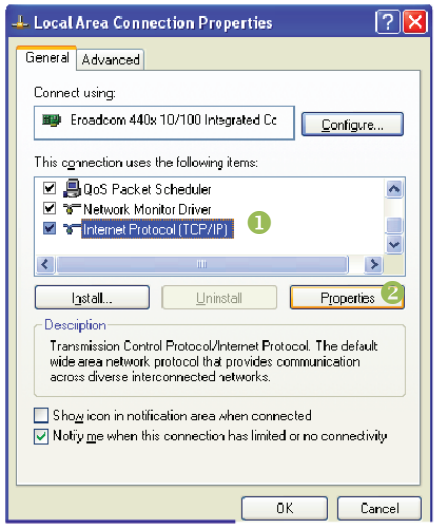


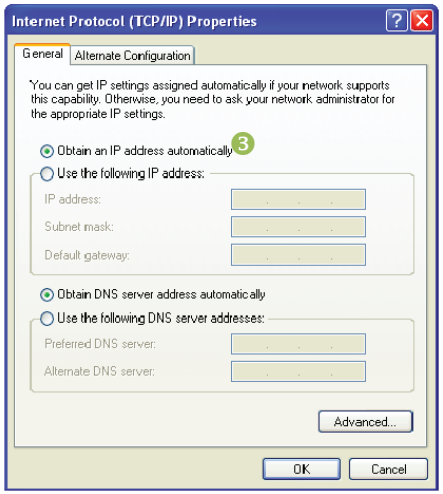
5.1 Ethernet Device Settings

5.1.1 Using the DHCP to deploy addresses automatically

The FATBOX's DHCP server is enabled by default and its IP addresses are **192.168.1.1 (port 'LAN')** and **138.0.19.1 (port 'ETH2').**

For your initial setup, we suggest setting your computer's LAN Internet Protocol (TCP/IP) to automatic. Do this by going to: *Control Panel> Network and Sharing Center> LAN Configure> TCP/IP (IPv4)* ❶ *Properties* ❷*> Obtain IP address automatically* ❸*.*




Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
3
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel

5.1.2 Setting host addresses manually

Alternatively, you may choose to manually configure your device so it has a fixed local IP address. Input the IP address following this format.

IP address	· **192.168.1.XXX**[1] if you have connected it to **port 'LAN'** or · **138.0.19.XXX** if your connection is to **port 'ETH2'**
Subnet Mask	*Usually automatically set to **255.255.255.0***
Default Gateway	· **192.168.1.1** if you have connected to **port 'LAN'** or · **138.0.19.1** if you have connected to **port 'ETH2'**
Preferred and Alternate DNS Server	*Obtain DNS server addresses automatically or Choose your own DNS Servers*

1. The host ID XXX should be a number between 2 to 254 and should not be duplicated within the same local network.

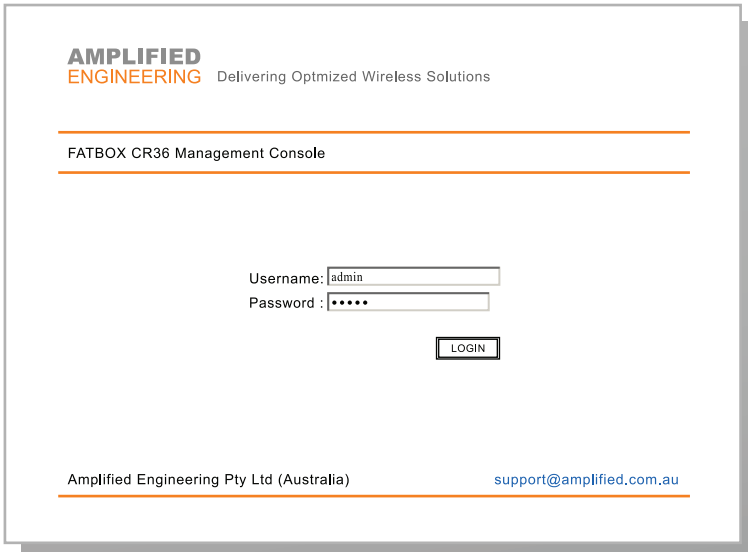
5.2 Serial Device Settings

If you are connecting a serial device to the FATBOX for Serial Log Monitoring, Serial DTU (Transparent Transport) or Serial Modem, you will need to set the device's serial port to the following setting to initiate a connection.

Baud Rate	**115200** bps
Data Bits	**8** Data Bits
Stop Bits	**1** Stop Bit
Parity Check	**No** Parity Bit (None)
Flow Control	**No** Flow Control (None)

If you want to configure the serial ports to your own settings you may do so via the serial configure menu in the web console. Refer to section 7.1.4 on page 22 to read about configuring the serial port.

6.1 Logging in to the B.A.S.E



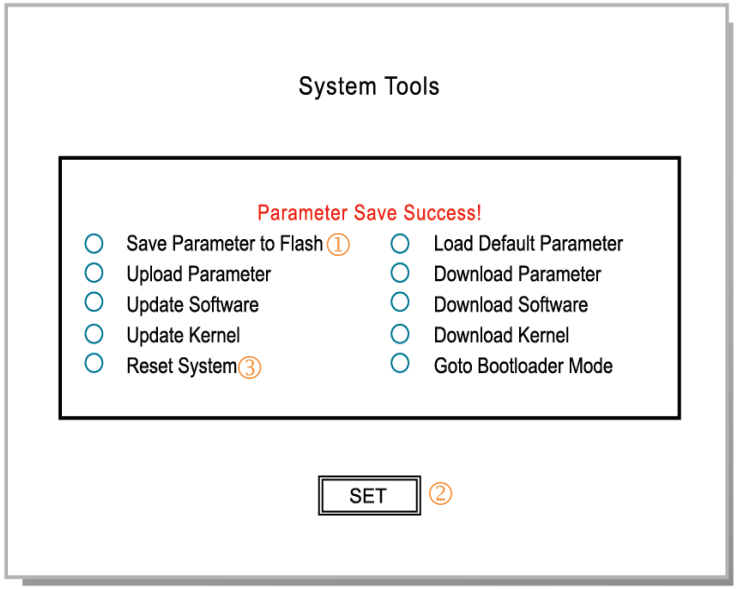
Connect your computer to port LAN on the B.A.S.E with the Ethernet CAT5 cable provided. Wait a few moments for your computer to register the device then open your web browser and type in "192.168.1.1" into the URL tab (We advise users to turn off their laptop's wireless connection to avoid the chance of any clashes in IP addressing during the log in process).
Enter as following in the LOGIN page:

USERNAME: admin
PASSWORD: 12345

You may change the username and password from within the console.

The DHCP server is activated by default. It will assign a local IP address of 192.168.1.2 to the first Ethernet device attached to port 'LAN'. The first Ethernet device attached to port 'ETH2' will be given an address of 138.0.19.2.

6.2 Saving Parameter Changes



After the making changes to your FATBOX's configuration, you have to go to *System Manage* > *System Tools* and Save the parameter changes to Flash and RESET as following.

Choose "Save Parameters to Flash" ① and click on SET ②.

Then you may reset the system by choosing "Reset System" ③ and then click "SET" ②. Alternatively you may choose to reset by unplugging the power cord for a few seconds. The new settings will be in place when the B.A.S.E reboots.

▷ IMPORTANT: Please wait till the message "Parameters Save Success" is displayed before resetting the FATBOX. A premature reset may corrupt the unit's configuration. If this happens you will need to use the serial console to load the default settings to the box. (See section 9.3.3 on page 41 to do this.)

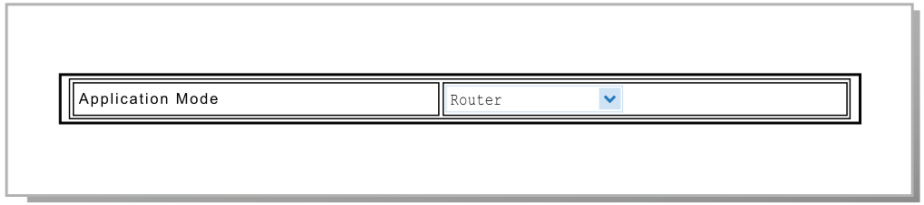
Welcome to the FATBOX Web-Console menu. If you are already logged in, the following segment will run you through the various settings and configurations you can make through your web browser. Please ensure that you have covered segment 6.2 on saving parameter changes before you continue. The web console is recommended for users who prefer having an intuitive interface to manage their routers.

7.1 System Parameters

The FATBOX B.A.SE is smartly designed so that a single product may be deployed in a variety of ways around your network in a cost effective manner. Section 7.1 covers how to set up the B.A.S.E to the way that you'll like to use it.

7.1.1 Application Configure – the B.A.S.E may be applied as a Router, an M2M (Client or Server) or as a Modem.

- ROUTER Mode



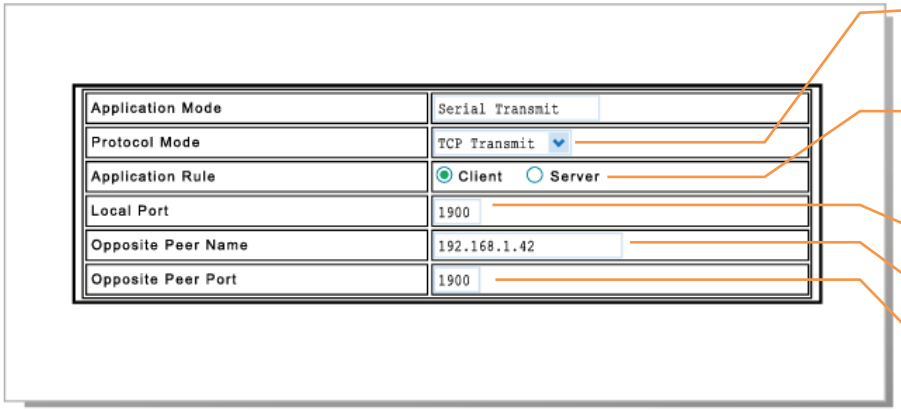
The Router mode is set by default.

- SERIAL TRANSMIT Mode

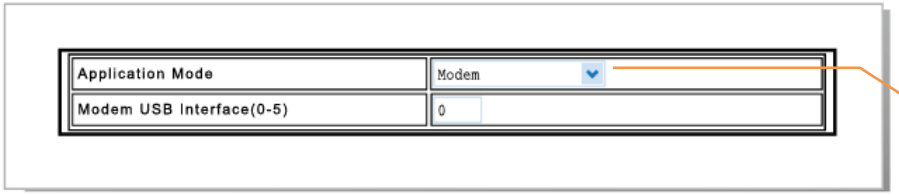
The most common applications of the Serial Transmit Mode are:

- A 'point-to-point' topology where a FATBOX connects directly to another FATBOX. This networks the communication between the two serial ports. The initiating router's Application Rule is 'Client' and the other is 'Server'.

- To connect the FATBOX directly to a server via TCP/IP (e.g. for metering)



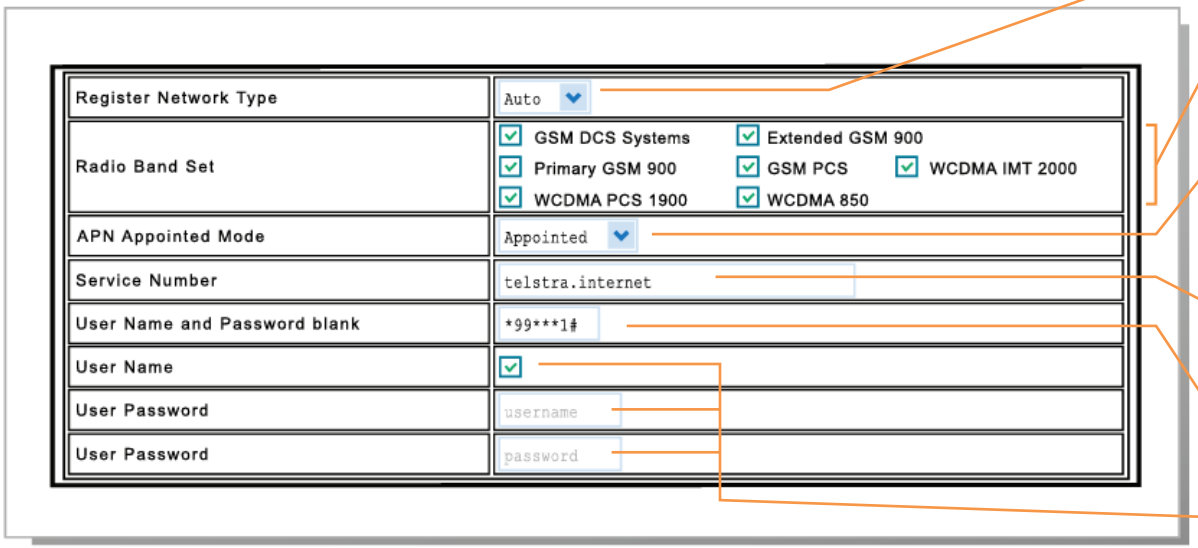
⦸ MODEM MODE



To configure the FATBOX to work as a serial modem please proceed to "Serial Configure" (Section 7.1.4) to set up the serial port configuration to work with your local device.

7.1.2 Services Configuration

To begin connecting to a cellular data network you will need to set up the Services Configuration menu found in System Parameters. Note that much of the information required here would have to come from your cellular operator.



Set to 'Auto' unless you want to limit connection to a particular network.

Choose specific bands if you want to limit your connection to particular networks

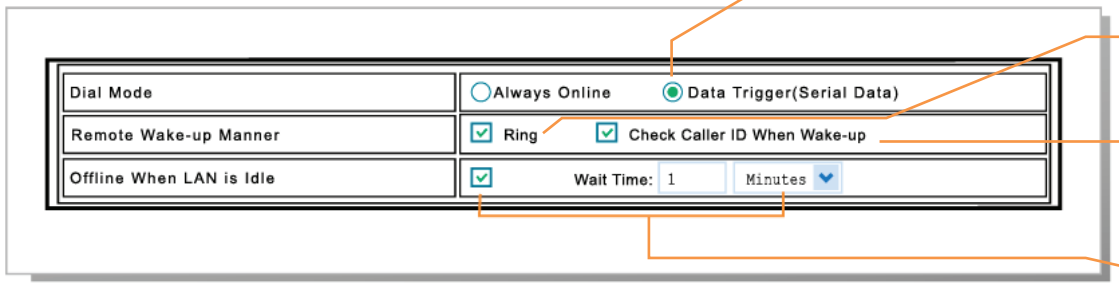
For some networks, router can get settings automatically. Set to 'Appointed' and manually enter settings if unsure.

Ask service provider. It's something like "telstra.internet" or "tmobile".

Ask service provider. Usually it is "*99#" or "*99***1#".

Ask service provider. Not always necessary. Check the "Username and Password Blank" box if service provider requires the two fields to be left blank.

If you want the B.A.S.E to be always on operation click the "SET" button to confirm the settings now. Otherwise continue to configure the following section.



Check Data Trigger if you want the B.A.S.E to **only** go online when there is incoming serial data or if it receives a *Wake Up* call.

Check "RING" to allow incoming call to *Wake Up* unit for PPP reconnection.

Check "CALLER ID WHEN WAKE " if you want authentication against the caller's number (Set in Section 7.3.8 - Advanced Parameters)

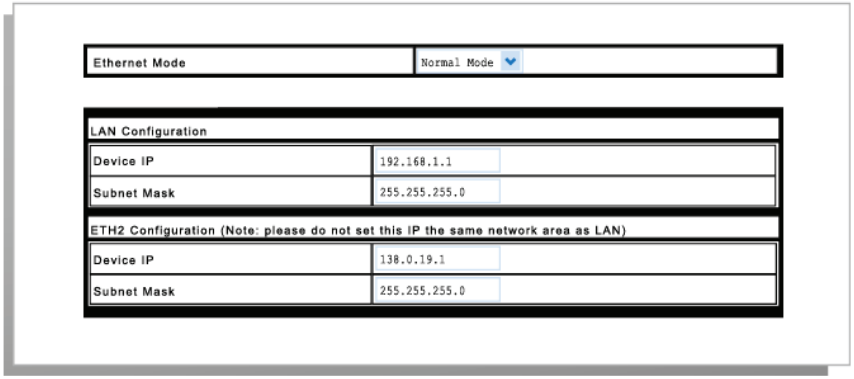
Check to disconnect PPP and *Sleep* when the Ethernet port is idle longer than the "Wait Time" set. This saves costs for users with infrequent data transmissions on metered data plans.

7.1.3 Ethernet Configure

You can configure the B.A.S.E's Ethernet ports to function in the 4 different modes described below.

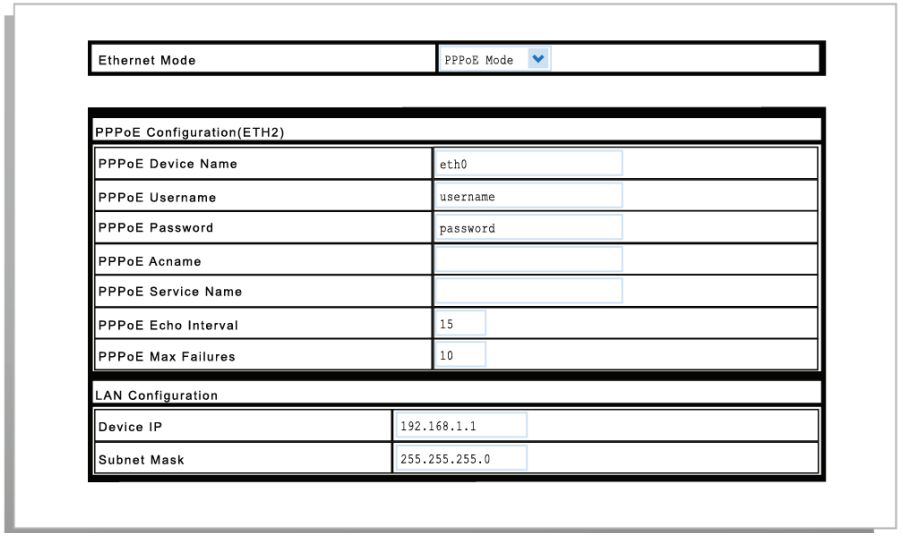
- Normal Mode

In this mode, the BA.S.E functions as a gateway where the two Ethernet ports work as separate subnets to connect to the Internet or VPN via the cellular network.



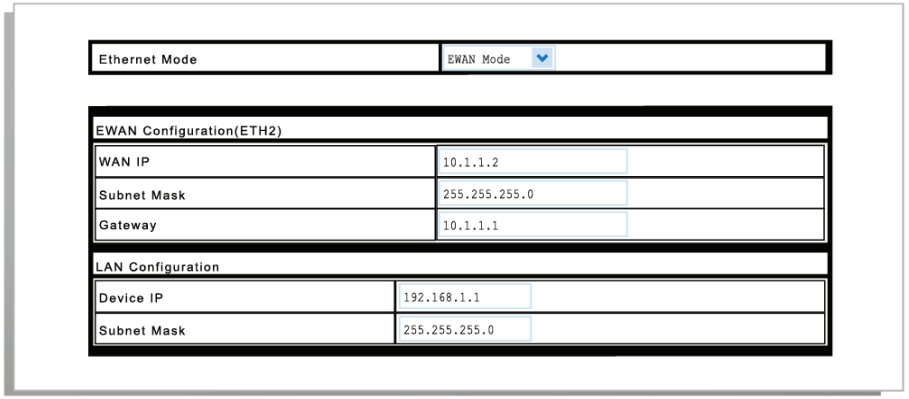
- PPPoE Mode

The PPPoE mode enables the B.A.S.E to *dial-up* via a separate modem. The WAN (e.g. ADSL) modem should be set up in the 'Bridge'/'PPPoE Relay' Mode and connected to the B.A.S.E's ETH2 port. It is important to prevent the WAN modem from connecting automatically in this set up so that the B.A.S.E will be assigned with the network's IP address.



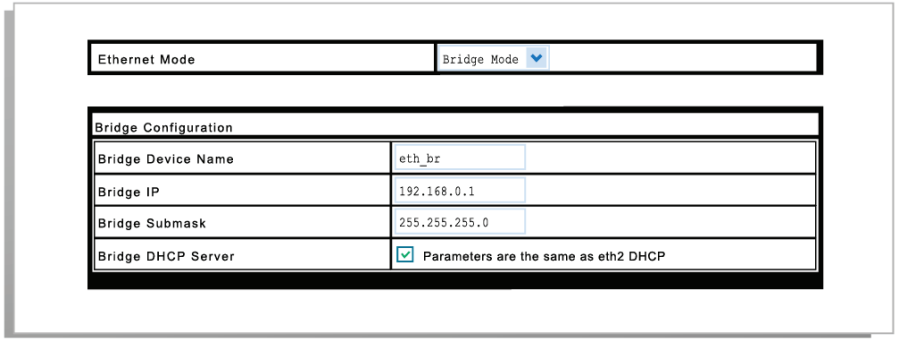
- EWAN Mode

In this mode, all the LAN traffic is uplinked via ETH2. In the example given, the FATBOX is connected to the ADSL modem with IP address 10.1.1.1.



- Bridged Mode

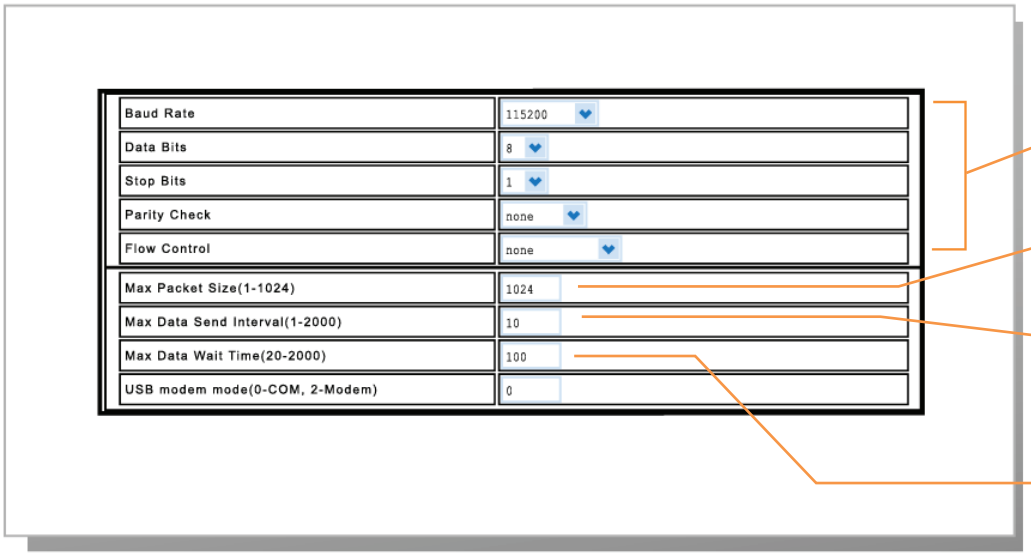
In this mode, both the LAN and ETH2 ports are *bridged* and will have the same Ethernet IP address and subnet.



7.1.4 Serial Configure

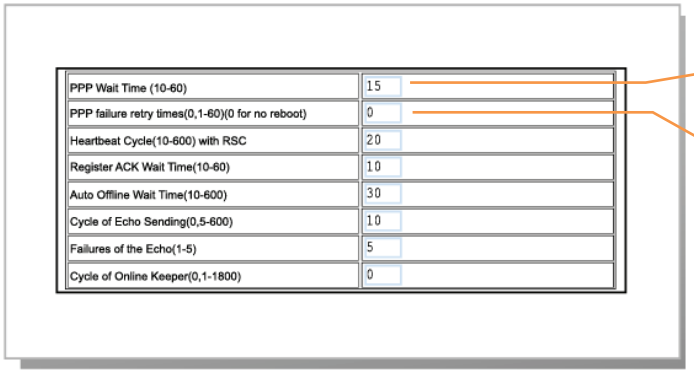
The serial port may be used for one of three operations

- By default, as a “COM” port for making configurations, event logging or flash uploading
- As a Transparent TCP or UDP port (e.g. a DTU) in “COM” mode - See also Section 7.1.8, Output Debug Info on Serial Port.
- As a “MODEM” Serial Port (e.g. for Dial Up networking or for Sending/Receiving SMS)


Baud Rate
115200
Data Bits
8
Stop Bits
1
Parity Check
none
Flow Control
none
Max Packet Size(1-1024)
1024
Max Data Send Interval(1-2000)
10
Max Data Wait Time(20-2000)
100
USB modem mode(0-COM, 2-Modem)
0
The factory default settings.
This is the max serial data that the router can send during the “Max Data Send Interval”.
This configuration decides how often the serial port data will be sent when you are using the TCP or UDP Serial Transmit mode.
This configuration decides how often the TCP or UDP Transparent Transport port transforms serial data

7.1.5 Timer Configure

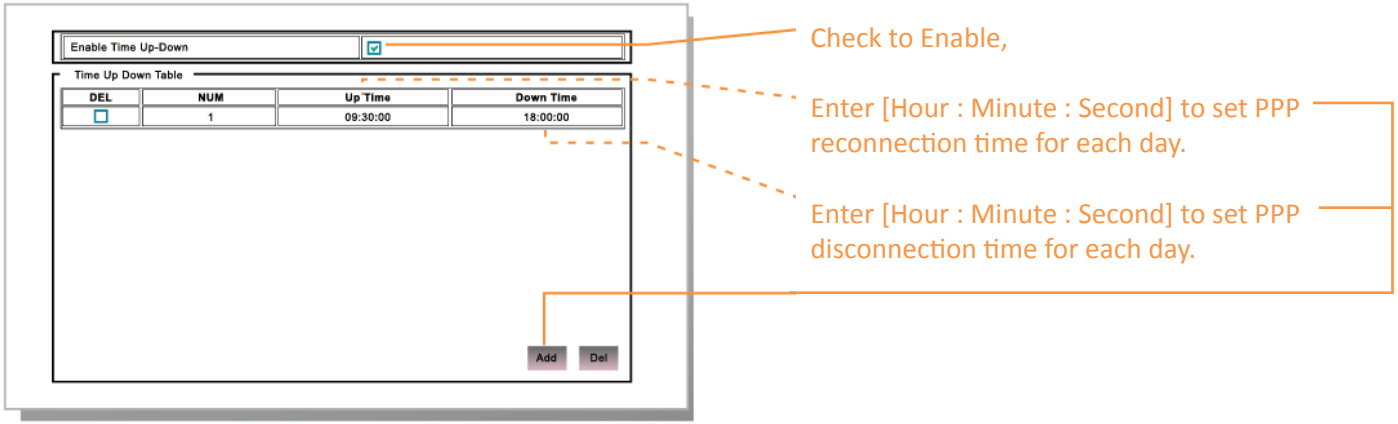
Here you can set the router to automatically reconnect PPP sessions or reboot.


PPP Wait Time (10-60) 15
PPP failure retry times(0,1-60)(0 for no reboot) 0
Heartbeat Cycle(10-600) with RSC 20
Register ACK Wait Time(10-60) 10
Auto Offline Wait Time(10-600) 30
Cycle of Echo Sending(0,5-600) 10
Failures of the Echo(1-5) 5
Cycle of Online Keeper(0,1-1800) 0
Configures the dwell time between 'Retry-to-Connect' PPP sessions with Data Service Provider. Configure between 10 to 15 seconds.
Configures the number of times the FATBOX tries to connect PPP sessions with the Data Service Provider before it reboots. Set between "1~60" times or "0" for infinite retries without rebooting (default).

The other settings in this segment are for specific network operations and we do not advise the normal user to make any modifications there.

7.1.6 Timer Up-Down

If the GPRS or NTP time sync[2] is reliable upon power up, the FATBOX can be programmed to have specific PPP connection and disconnection times each day.



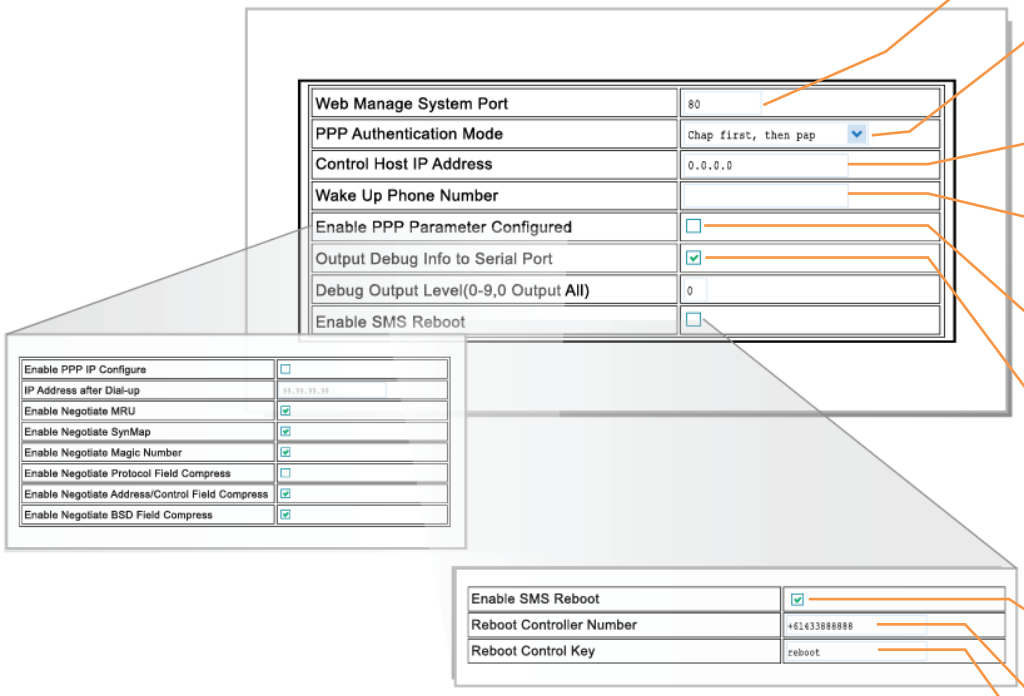
2. See Section 7.2.7 for NTP

7.1.7 Reboot Redial Conditions

This is a custom application specific function. Please contact support@amplified.com.au for advanced user application support.

7.1.8 Advanced Parameters

You can use this menu to configure some of the specific parameters outlined below.



Web Manage System Port: By default it is set to 80. You may change it to improve security if the router is on a public IP network.

PPP authentication mode: Please ask Network Service Provider or else leave as it is. It can be configured to “PAP Only”, “CHAP Only” or “CHAP first and then PAP” (default).

Control Host IP address: Registers the IP address of the host that controls the PPP connection.

Wake Up Phone Number: Configures the Caller ID to authenticate incoming calls for the “Remote Wake Up Manner: RING” (See Services Configuration, Section 7.1.2).

Enable PPP Parameter Configure: If checked it will allow for the advanced configuration of PPP negotiation.

Output Debug Info on Serial Port: The default Serial Setting [115200/8/1/NoneParity/NoneFlowControl] is configured to “0” (i.e. Serial Port Debug Mode). If the router’s serial port is used for data transmission (e.g. TCP Serial Mode), this box must be checked.

SMS to Reboot: The FATBOX can be rebooted remotely via SMS from a specific cell phone.

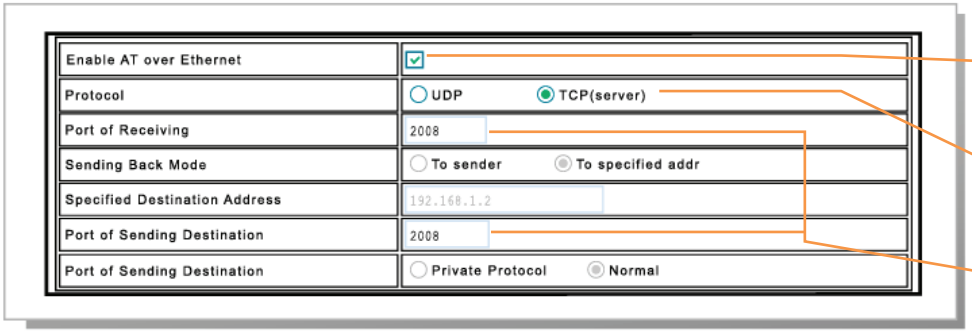
Enter the phone number sending the SMS to the FATBOX

Enter the SMS ‘string’ to reboot the FATBOX

7.1.9 AT over Ethernet

This is useful to allow local host devices that are connected by Ethernet to send an SMS or check the module's status by using AT commands.

Note that a "?" will be returned if the HSUPA Module is not ready (e.g. still negotiating a PPP session) instead of a typical "OK".



Example Application: A PLC sends an SMS alert to the B.A.S.E while it is still connected to the Internet as a router. Assuming the default settings (shown above) is used, the following TCP messages will be sent to 192.168.1.2:2008.

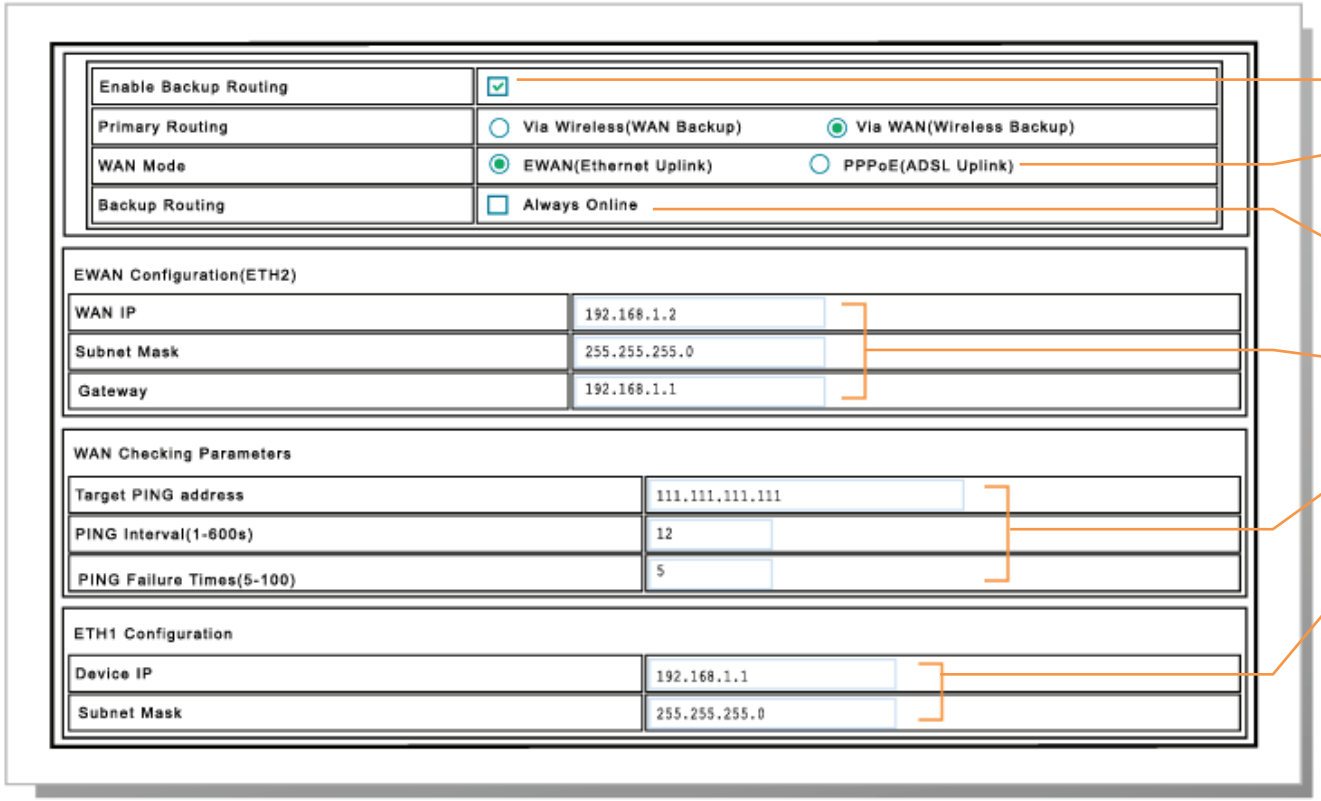
Commands Issued	Description
AT+CMGF=1	To engage TEXT mode (instead of PDU mode)
AT+CSCA="+61418706700"	Sets the SMS Center number of the cellular data provider (e.g. for Telstra Australia)
AT+CMGC+"+61XXXXXXXX"	Sets the mobile number that will receive the SMS (+61XXXXXXXXX)
ALARM!	The message to be sent is "ALARM!"
<CTRL-Z>	Sends the message

7.1.10 Backup Routing

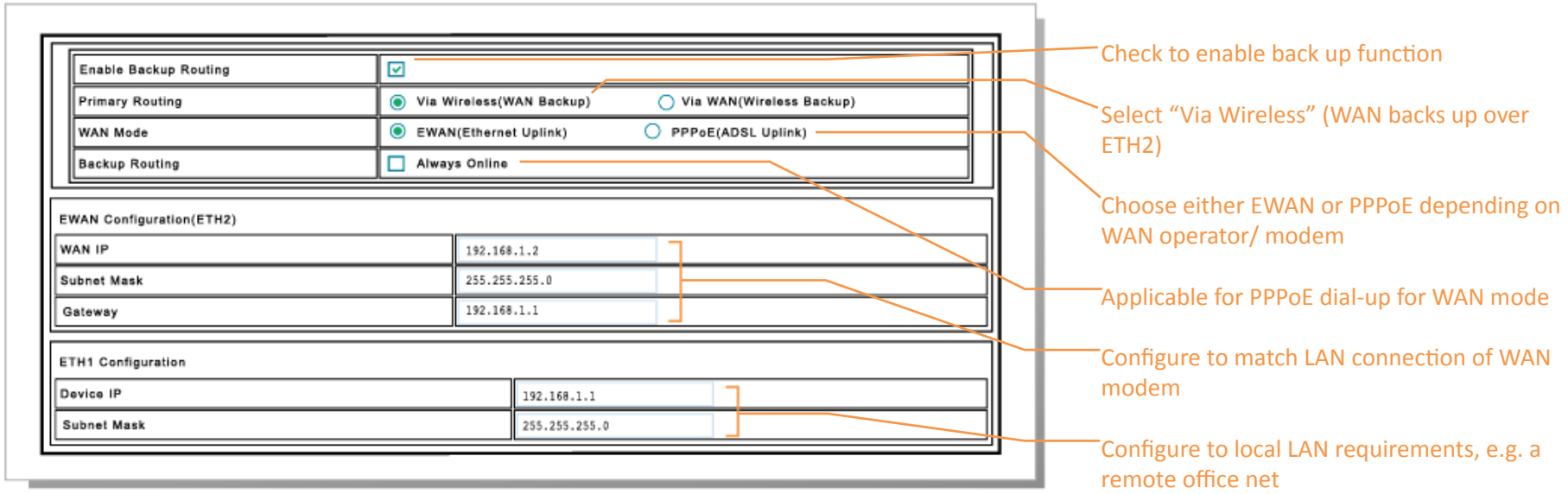
Type 1: Back up a Primary WAN connection (e.g. an ADSL modem) using Wireless (HSUPA)

The B.A.S.E can automatically back up failed WAN connections to HSUPA.

If the B.A.S.E is not able to get a PING response from a target server after certain number of tries, it will switch the data route to the HSUPA link. The route will be switched back if PING response (via the WAN port) has recovered.



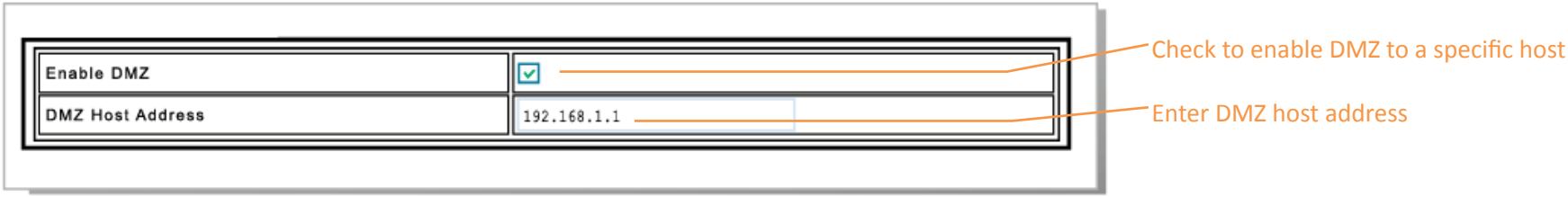
Type 2: Back up a Primary Wireless connection (HSUPA) using a WAN connection (e.g. an ADSL modem)



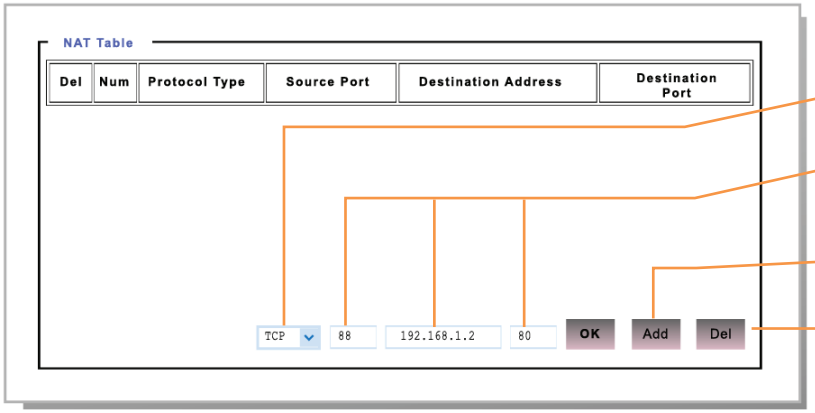
7.2 Network Configuration

7.2.1 NAT

For flexible LAN setups, FATBOX supports both DMZ and NAT (Network Address Translation) configurations.



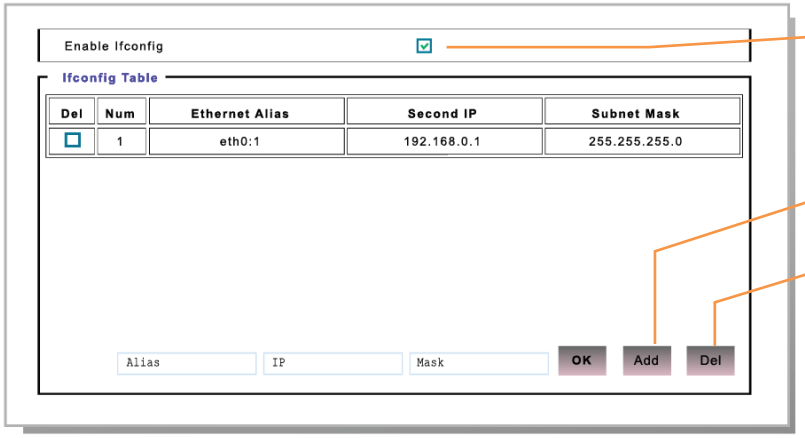
∴ DMZ must be DISABLED in order to allow Port Forwarding (NAT)



In the cited example, if a public IP (whether static or resolved by DDNS) of 222.222.222.222 is assigned by the network service provider, then pointing a remote application to 222.222.222.222:88 will connect it to local device 192.168.1.2's port number 80 (web server).

7.2.2 IfConfig

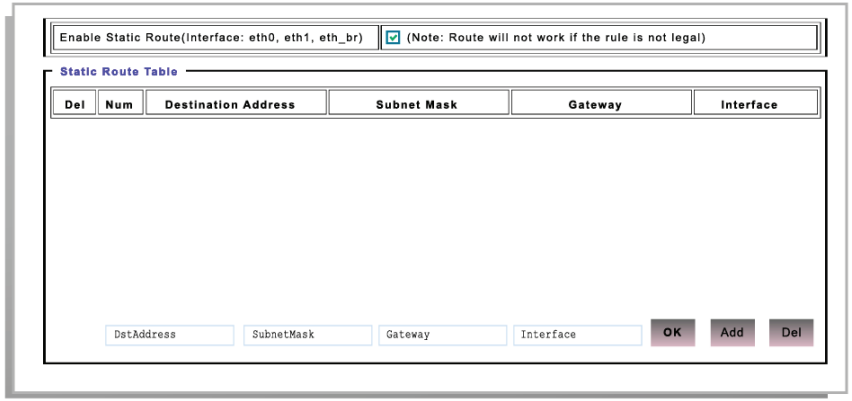
The router can be accessed through an additional IP address via its LAN/ETH2 port if IfConfig is set up.



In the example given, Ethernet Alias is formatted as "eth0:xxx" to give an additional interface to access the router.

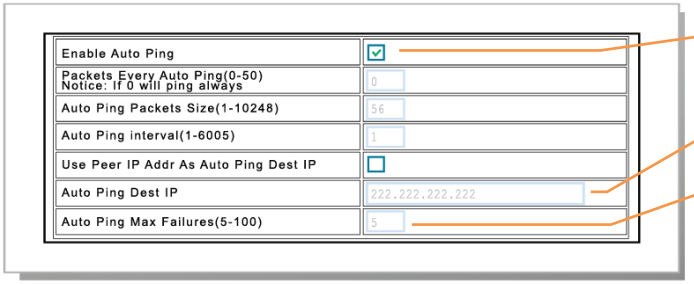
7.2.3 Static Route

If you are set up for PPTP or IPSEC VPN, it is a typical requirement to configure your Static Route table to route VPN address packets via the VPN gateway and interface instead of an unsecured cellular gateway.



7.2.4 Auto PING

The Auto PING function reboots the B.A.S.E after the maximum number of PING failure from the target server IP. This is useful as in many cases the reboot frees a 'locked' PPP session.

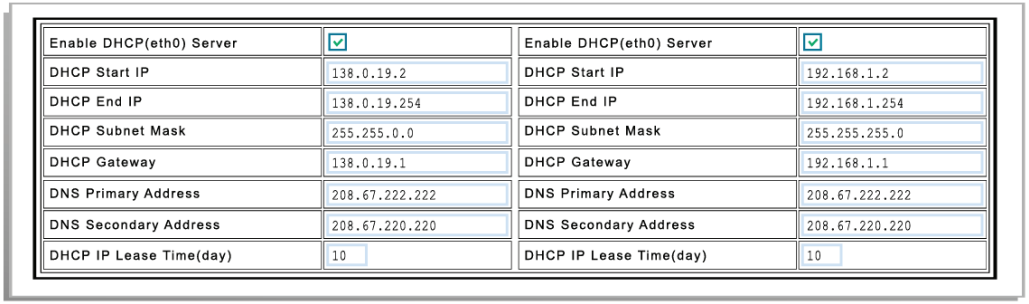

Enable Auto Ping
Packets Every Auto Ping(0-50)
Notice: If 0 will ping always
Auto Ping Packets Size(1-10248)
Auto Ping interval(1-6005)
Use Peer IP Addr As Auto Ping Dest IP
Auto Ping Dest IP
222.222.222.222
Auto Ping Max Failures(5-100)
Enables Auto PING function
Target server's external IP address
FATBOX reboots after this number of PING response failures from the target server

7.2.5 DHCP

The FATBOX router has two Ethernet ports (LAN and ETH2) with independent configurable modes and interfaces.

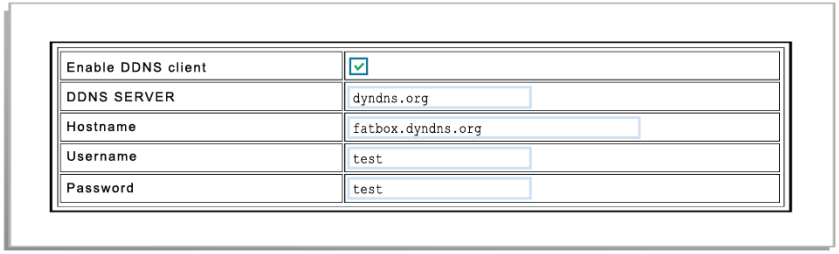
In the Ethernet Bridged Mode (Section 7.1.3 on page 21) the eth0 settings will be used for the bridged subnet.

In the factory default, the DNS addresses are configured to point to OpenDNS server addresses.



7.2.6 DDNS (Dynamic DNS)

In many cellular data networks, the provisioning of static and public IP is a difficult and often expensive exercise. If public IP is available, FATBOX can be configure to register its assigned remote public IP address to a DDNS service provider (e.g dyndns.org) so that its session's temporary IP can be resolved by a unique domain name.



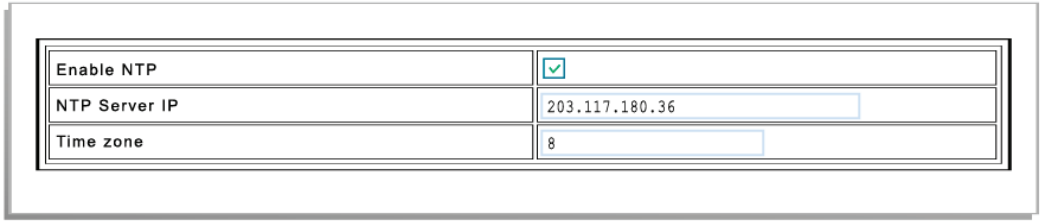
∴ Troubleshooting: Serial connection is required to access the serial console (See section 9). Enter "set advanced" and configure the DDNS debug information setting.

When DDNS (and PPTP) serial debug mode is ON, the serial terminal must be connected to enable sessions to be completed.

After troubleshooting is completed, please disable the debug to allow the FATBOX to operate without a serial device attached.

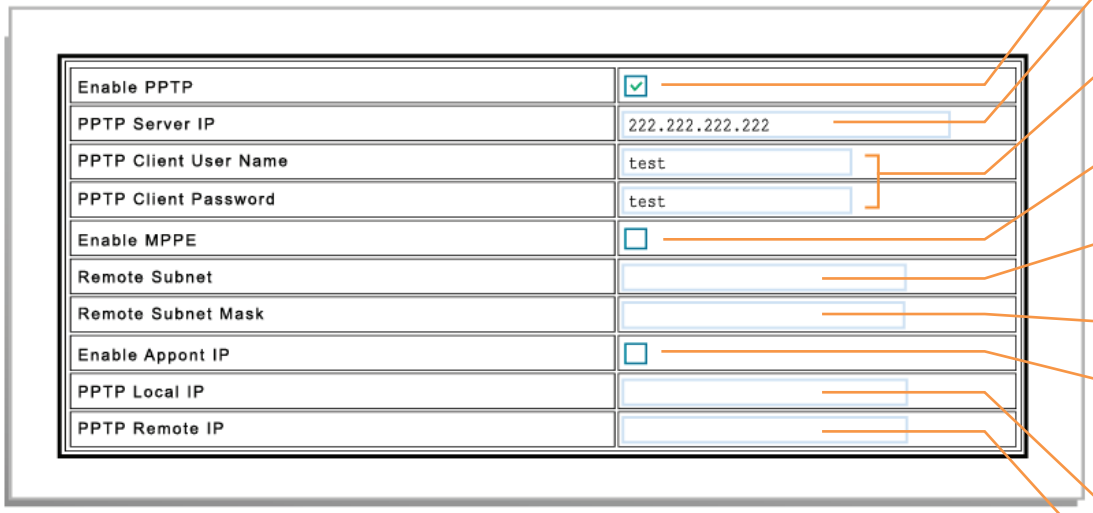
7.2.7 NTP

NTP (Network Time Protocol) is a protocol to synchronize the clocks of computers over a network. The FATBOX router can update its internal clock upon power up and connection to the Internet. This clock can be used to control the router's PPP connection and disconnection and is also used for some VPN protocols.



7.2.8 PPTP

Please configure PPTP settings to match your PPTP VPN server settings. In some cases you will also need to configure the router's Static Route (see section 7.2.3) to enable proper routing of VPN traffic via the PPTP tunnel.



Check to enable PPTP tunneling

Enter the PPTP server that the router will connect to

Enter the Username and Password for the PPTP authentication

Enable MPPE encryption (Check with PPTP VPN server)

Enter the IP Address of the subnet on the server side

Enter the Subnet Mask on the server side

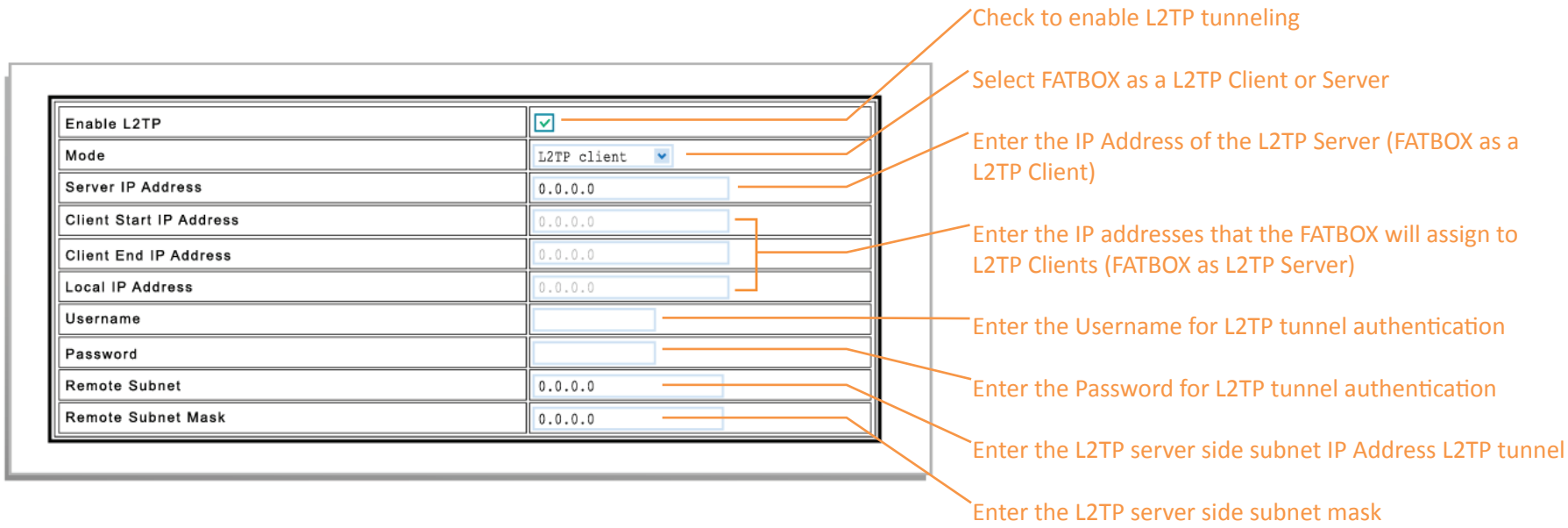
Check to assign VPN IP address to both client and server sides of the PPTP. The PPTP server should also be configured with this option also.

Enter the Client side IP address of the PPTP

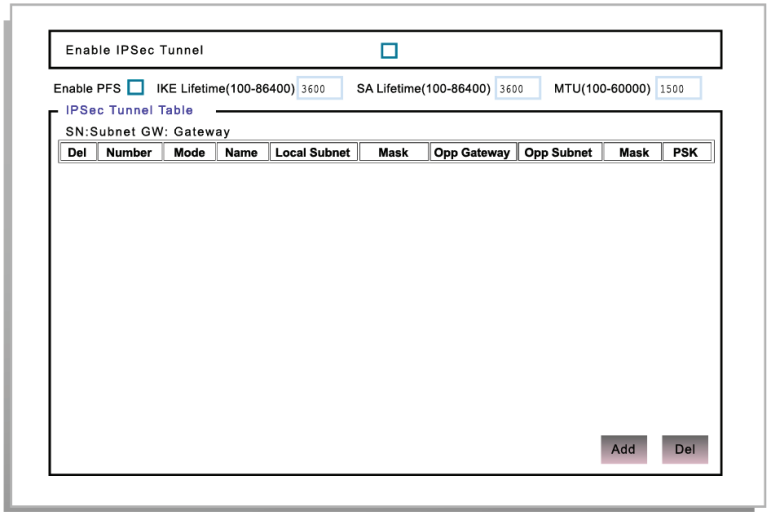
Enter the Server side IP address of the PPTP

7.2.9 L2TP

FATBOX can support L2TP tunneling either as a Client or a Server (Supporting up to a maximum of 16 Clients).


Enable L2TP
Mode
L2TP client
Server IP Address
0.0.0.0
Client Start IP Address
0.0.0.0
Client End IP Address
0.0.0.0
Local IP Address
0.0.0.0
Username
Password
Remote Subnet
0.0.0.0
Remote Subnet Mask
0.0.0.0
Check to enable L2TP tunneling
Select FATBOX as a L2TP Client or Server
Enter the IP Address of the L2TP Server (FATBOX as a L2TP Client)
Enter the IP addresses that the FATBOX will assign to L2TP Clients (FATBOX as L2TP Server)
Enter the Username for L2TP tunnel authentication
Enter the Password for L2TP tunnel authentication
Enter the L2TP server side subnet IP Address L2TP tunnel
Enter the L2TP server side subnet mask

7.2.10 IPSEC Tunnel



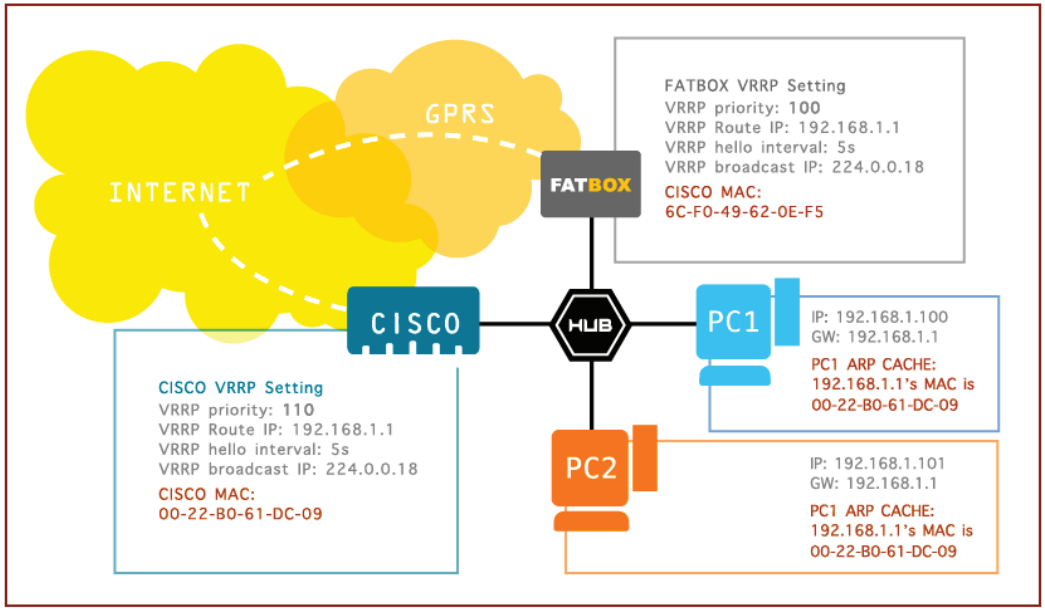
FATBOX supports IPSEC (PSK) tunnels to an IPSEC VPN Server configured to the following settings.

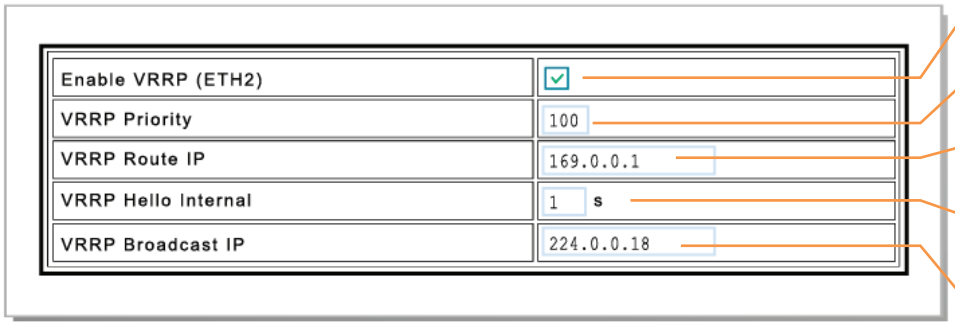
Using IKE
Exchange Mode: Main Mode
Remote Identity Type: IP Address
Using Pre-Shared Keys (PSK)
Encryption Algorithm: MD5
Configurable MTU, SA and IKE Lifetime
Enable/Disable PFS

The configuration and deployment of IPSEC is exact and expected to be configured by expert networking engineers with working knowledge of their IPSEC VPN servers at their back-office. Please contact support@amplified.com.au for further information.

7.2.11 VRRP

Virtual Router Redundancy Protocol (VRRP) enables two or more configure routers to 'switch' between themselves, electing a primary router based on their VRRP priority assigned.





Connect the FATBOX via the ETH2 port to the network of other routers and network devices.

Priority assigned to each router. Choose from 1 to 254, the larger number has higher priority.

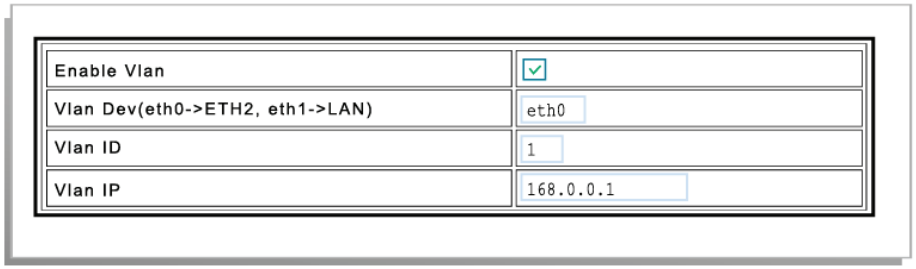
Enter the Virtual Router's IP Address. Assign the same IP address on each VRRP router.

Elapsed time for VRRP Master to send multicast packets to all registered routers, failure to do so will cause the next ranked VRRP router to take over.

All VRRP routers in the network must have the same broadcast IP. It is by default 224.0.0.18 but is modifiable.

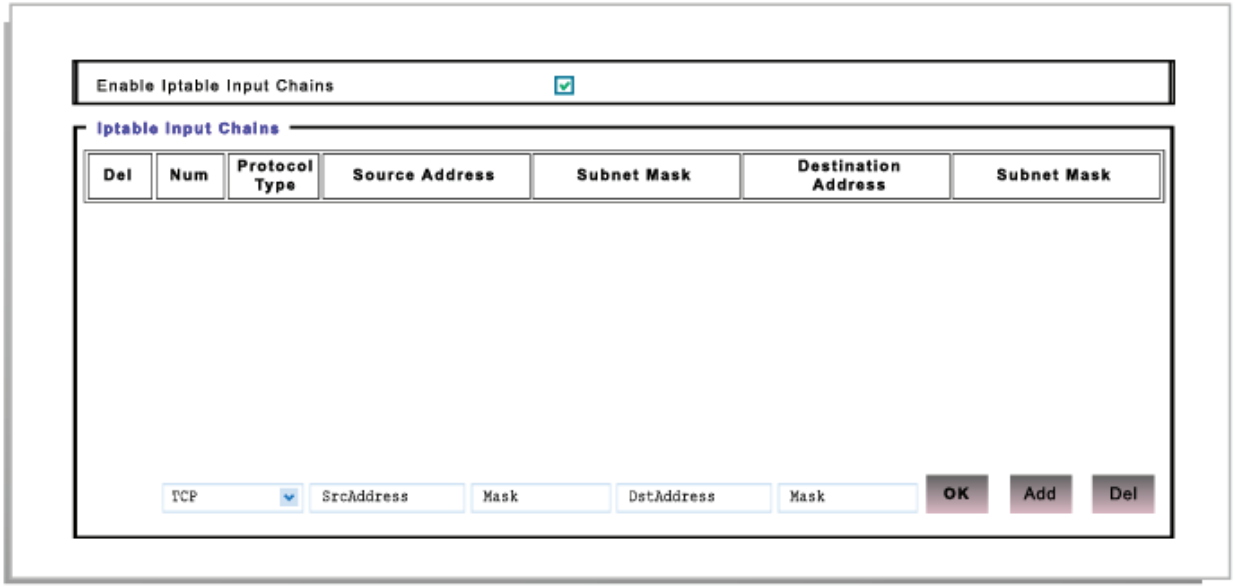
7.2.12 VLAN

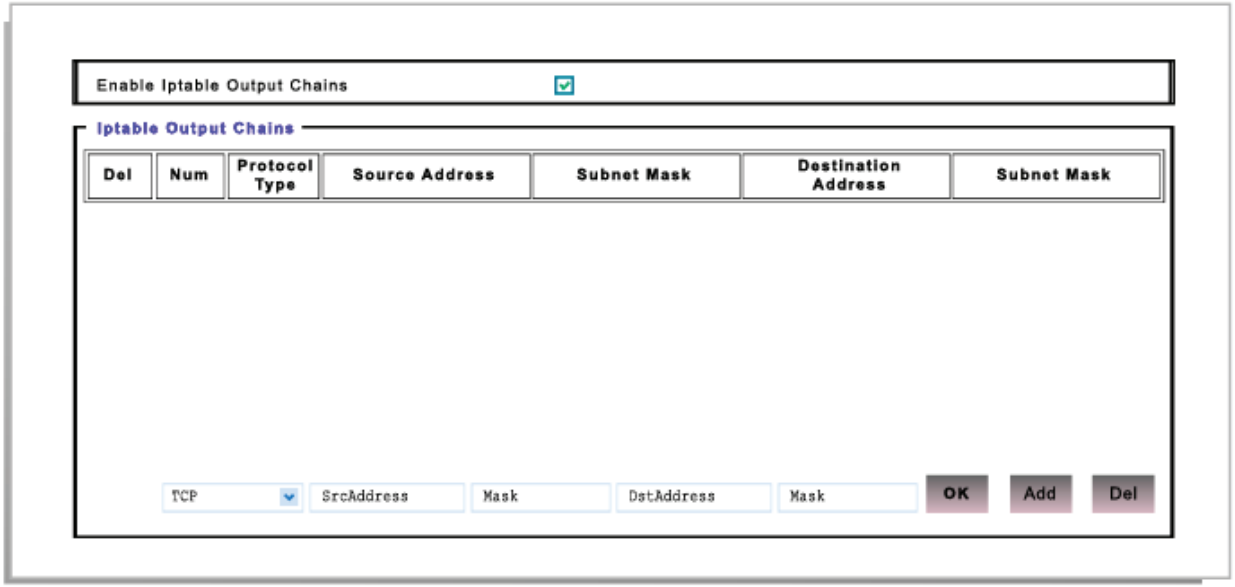
Enabling VLAN allows the FATBOX to work with VLAN-aware switches by assigning one of its Ethernet interface a suitable VLAN ID and IP address.



7.3 Security Configure

FATBOX supports **Iptable** input and output table configuration. Iptable scripting is also supported.





Basic Iptables (v1.2.7a) scripting commands are listed below for guidance.

Iptable Script Guidelines (supporting iptables v1.2.7a)

```
Usage: iptables -[AD] chain rule-specification [options]
       iptables -[RI] chain rulenum rule-specification [options]
       iptables -D chain rulenum [options]
       iptables -[LFZ] [chain] [options]
       iptables -[NX] chain
       iptables -E old-chain-name new-chain-name
       iptables -P chain target [options]
       iptables -h (print this help information)
```

```
Commands:
Either long or short options are allowed.
  --append  -A chain          Append to chain
  --delete  -D chain          Delete matching rule from chain
  --delete  -D chain rulenum
                Delete rule rulenum (1 = first) from chain
  --insert  -I chain [rulenum]
                Insert in chain as rulenum (default 1=first)
  --replace -R chain rulenum
                Replace rule rulenum (1 = first) in chain
  --list    -L [chain]        List the rules in a chain or all chains
  --flush   -F [chain]        Delete all rules in  chain or all chains
  --zero    -Z [chain]        Zero counters in chain or all chains
  --new     -N chain          Create a new user-defined chain
  --delete-chain
            -X [chain]        Delete a user-defined chain
  --policy  -P chain target
                Change policy on chain to target
  --rename-chain
            -E old-chain new-chain
                Change chain name, (moving any references)
```

```
Options:
  --proto      -p [!] proto    protocol: by number or name, eg. `tcp'
  --source     -s [!] address[/mask]
                    source specification
  --destination -d [!] address[/mask]
                    destination specification
  --in-interface -i [!] input name[+]
                    network interface name ([+] for wildcard)
  --jump       -j target
                    target for rule (may load target extension)
  --match      -m match
                    extended match (may load extension)
  --numeric    -n          numeric output of addresses and ports
  --out-interface -o [!] output name[+]
                    network interface name ([+] for wildcard)
  --table      -t table    table to manipulate (default: `filter')
  --verbose    -v          verbose mode
  --line-numbers           print line numbers when listing
  --exact      -x          expand numbers (display exact values)
[!] --fragment  -f         match second or further fragments only
  --modprobe=<command>     try to insert modules using this command
  --set-counters PKTS BYTES    set the counter during insert/append
[!] --version   -V         print package version.
```

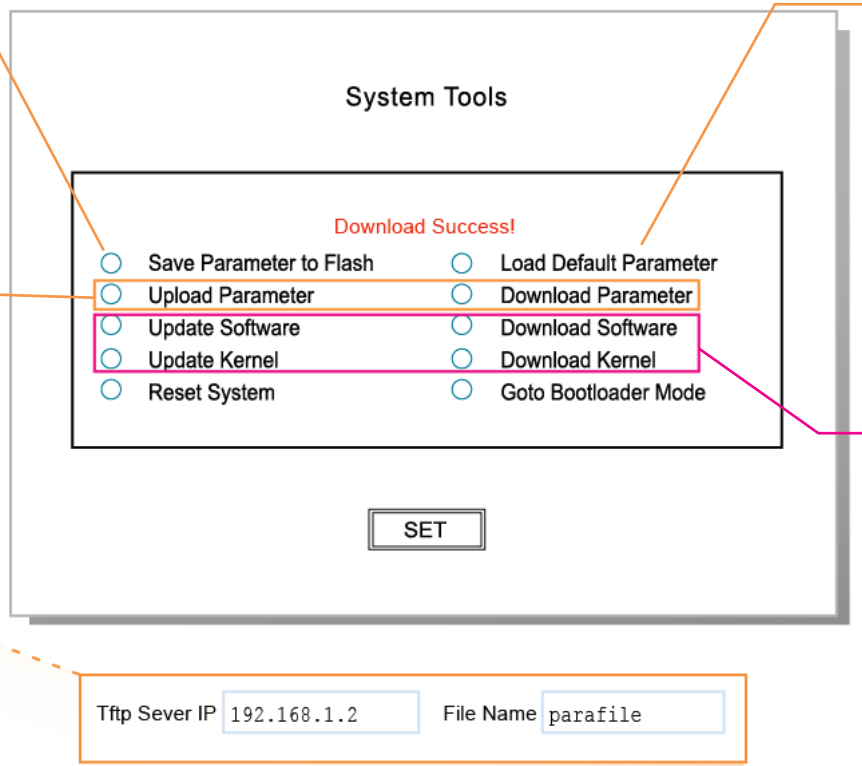
7.4 System Manage

7.4.1 Systems Tools

In this section are the system management tools for flash, kernel, parameters management and also the configuration of username and password to access the router. You can also find useful information about the cellular signal strength and basic connection of the device under the Device Status tag.

Check and Click "SET" to write the changes to the FATBOX's flash.
▷ Do not reboot/power-down the device until the writing process is acknowledged as completed.

(In order to run in an ETH-attached computer you will require a TFTP program such as tftpd32.) Check "Download Parameter" to save FATBOX Configuration parameters to a text file (e.g. parafile). You can then modify the file with a text editor and upload back to the FATBOX using the "Upload Parameter" feature. You will be required to indicate the computer's IP address and the parameter file name. When you are done, save the parameter to flash and reset the router.

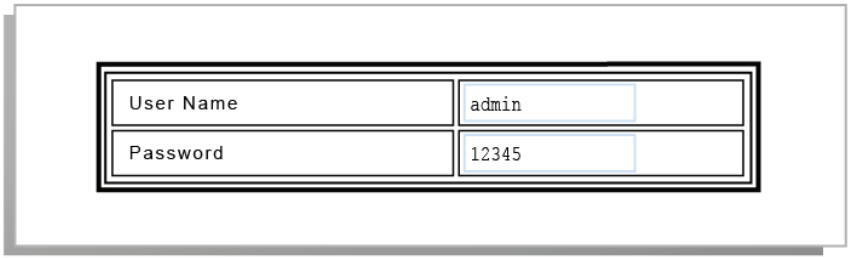


Allows uploading of the FATBOX parameters to Factory Default. Note that if the flash is corrupted, access to the Web Console may not be possible and the Factory Default will have to be load via the Serial Console. (See section 9.3.3)

▷ DO NOT EXECUTE unless under guidance of an Amplified Engineering technical support staff as the device's flash kernel or firmware could be corrupted if not done correctly.

7.4.2 User Manage

You may change the FATBOX's log in page's Username and Password settings for better security. To revert back to factory default see section 9.3 on page 41.



7.4.3 Device Status

This page provides *real time* update of the router's operation and network status, e.g. network signal strength and status, assigned IP addresses and VPN status.

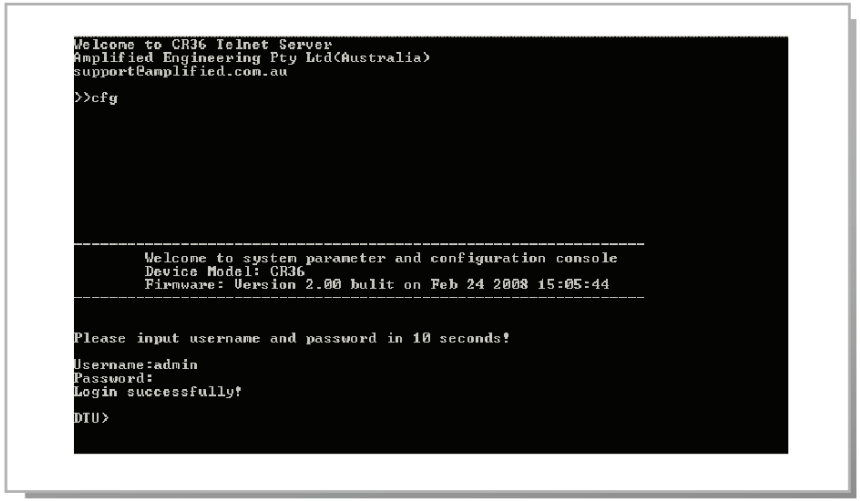
The table below will be able to give you some helpful tips regarding the level of Signal Strength

Quality of Signal	Levels	Description
Marginal	-95dBm or lower.	At these sort of levels, it is very likely that you may suffer low throughput and disconnects due to cell loading/breathing even with an outdoor antenna.
Workable under most conditions	-85dBm to -95dBm.	Probably worth considering an outdoor gain type antenna. Could suffer poor throughput and disconnects due to cell loading/breathing.
Good	-75dBm to -85dBm	Normally no problem holding a connection with this sort of level (even with cell breathing) without the use of an external antenna.
Excellent	Above -75dBm	Should not be affected by cell breathing/loading and should not require an external antenna.

In the case that your browser is unable to connect to the FATBOX, you can still configure the device via TELNET.

∴ You must be able to 'ping' the device in order to TELNET.

8.1 Logging In

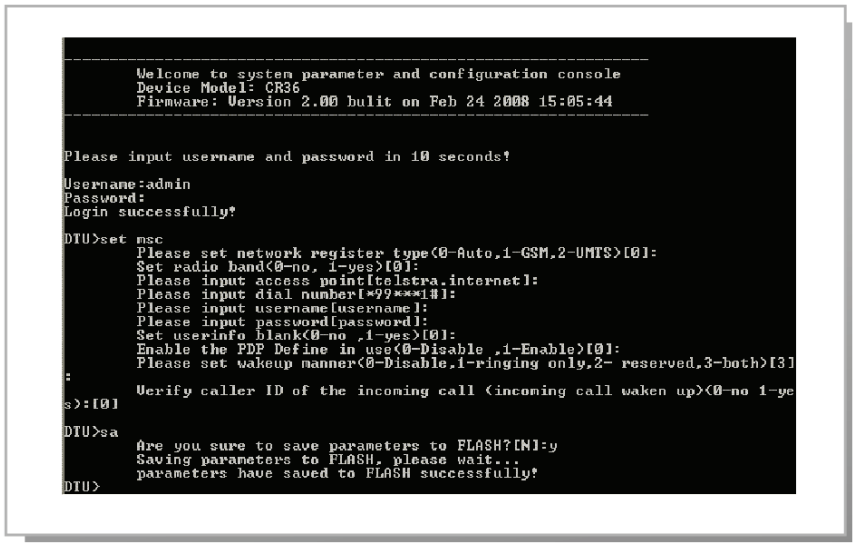


Open a new command prompt session *(Windows START>Run> Type "cmd" <Enter>).*

Enter "telnet 192.168.1.1" and the screen on the left will be shown.

Enter "cfg" and complete the log in within 10 seconds (The default Username is "admin" and password is "12345").

8.2 Configuring Cellular Operator Settings


Welcome to system parameter and configuration console
Device Model: CR36
Firmware: Version 2.00 bulit on Feb 24 2008 15:05:44
Please input username and password in 10 seconds!
Username:admin
Password:
Login successfully!
DTU>set msc
Please set network register type(0-Auto,1-GSM,2-UMTS)[0]:
Set radio band(0-no, 1-yes)[0]:
Please input access point[celstra.internet]:
Please input dial number[*99***1#]:
Please input username[username]:
Please input password[password]:
Set userinfo blank(0-no ,1-yes)[0]:
Enable the PDP Define in use(0-Disable ,1-Enable)[0]:
Please set wakeup manner(0-Disable,1-ringing only,2- reserved,3-both)[3]
Verify caller ID of the incoming call (incoming call waken up)(0-no 1-ye
s):[0]
DTU>sa
Are you sure to save parameters to FLASH?[N]:y
Saving parameters to FLASH, please wait...
parameters have saved to FLASH successfully!
DTU>

Enter "set msc" at the "DTU>" prompt.

Enter the parameters provided by your cellular operator.

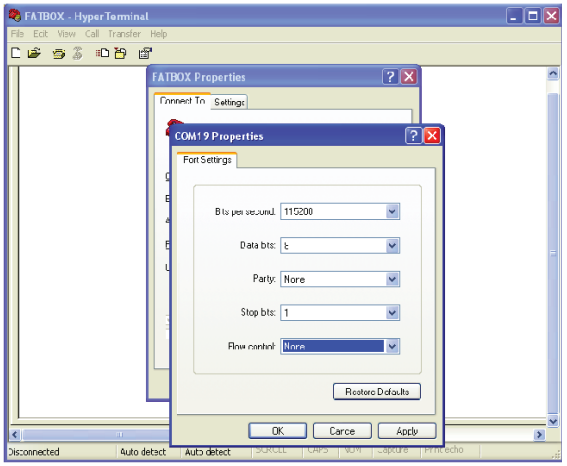
Enter "sa" to save changes to the router's Flash memory.

You can now reboot the box by entering "reset" or by switching off its power for a few seconds.

▷ IMPORTANT: Please wait till the acknowledgement message for saved changes is displayed before resetting the FATBOX. A premature reset may corrupt the unit's configuration. If this happens you will need to use the serial console to load the default settings to the box. (See section 9.3.3 to do this.)

9.1 Logging in via the Serial Port

If the FATBOX's firmware or parameters are corrupted, there is the possibility that the FATBOX may not respond to 'ping', TELNET or the web browser. You will need to access the box via its serial port to return the parameters in flash to the factory default.



Set the computer's serial port to the following configuration via a HyperTerminal program.

Once you are connected, keep the 'SPACE' key pressed while switching ON the FATBOX.

When prompted, please enter the username and password. If you have not changed the Log in settings the default username and password are as following.

USERNAME: admin
PASSWORD: 12345

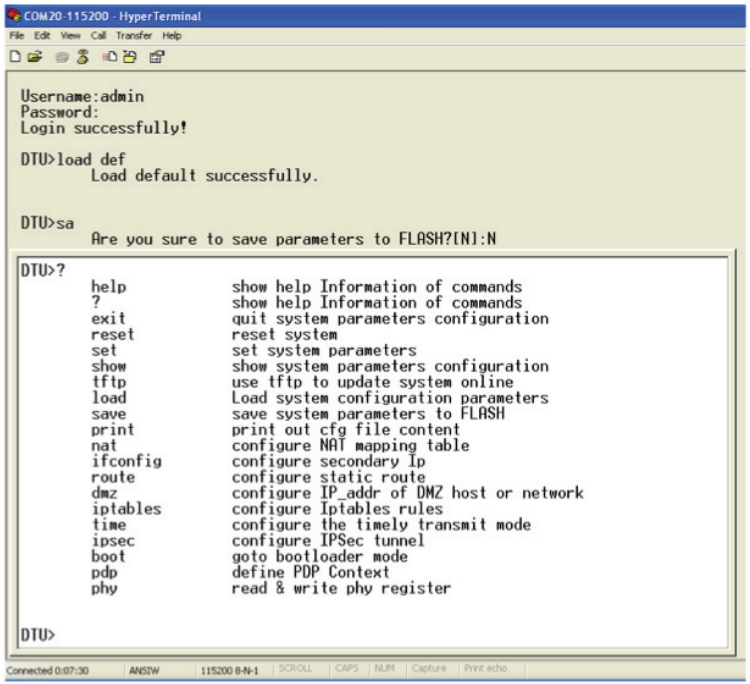
9.2 Serial Console Commands

All configuration commands are available via the Serial Console. As this mode is to be used by network professionals, this manual will not cover the usages of other commands.

To see a list of available commands type "?".

To display all settings and useful information for troubleshooting type "show all".

The Serial console configuration is for advanced users. Please email support@amplified.com.au for technical assistance.


COM20-115200 - HyperTerminal
File Edit View Call Transfer Help
Username:admin
Password:
Login successfully!
DTU>load def
Load default successfully.
DTU>sa
Are you sure to save parameters to FLASH?[N]:N
DTU>?
help show help Information of commands
? show help Information of commands
exit quit system parameters configuration
reset reset system
set set system parameters
show show system parameters configuration
tftp use tftp to update system online
load Load system configuration parameters
save save system parameters to FLASH
print print out cfg file content
nat configure NAT mapping table
ifconfig configure secondary Ip
route configure static route
dmz configure IP_addr of DMZ host or network
iptables configure Iptables rules
time configure the timely transmit mode
ipsec configure IPSec tunnel
boot goto bootloader mode
pdp define PDP Context
phy read & write phy register
DTU>
Connected 0:07:30
ANSIW
115200 8-N-1

9.3 Revert to Factory Default

9.3.1 The RESET Button

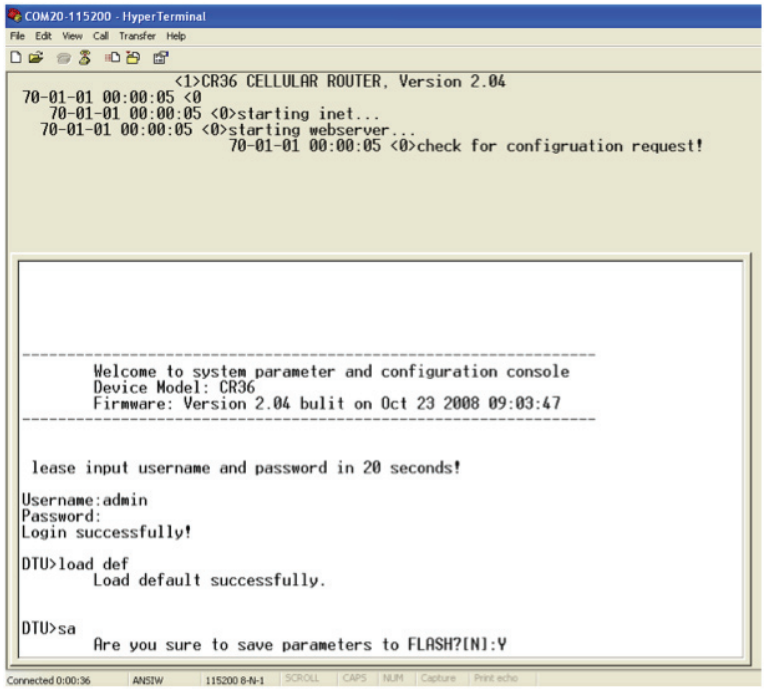
The easiest method to revert the router's configuration to factory default is to depress the RESET switch on the top of the router for 10 seconds.

9.3.2 Via Web Browser

If your are able to access the FATBOX's web configuration pages, please got to section 7.4.1 to "Load Default Parameter" via the System Tools menu.

9.3.3 Via the Serial port

The FATBOX's Flash memory may have been corrupted if the box was powered down before it had completed saving changes. As the result the DHCP function may not work and the user would not be able to access the router via the web browser or by TELNET.



To revert the B.A.S.E to factory default, complete the log in process described in section 9.1

After you are logged in enter the following commands

1. Enter "load def" to load default
2. Enter "sa" to save the changes to Flash
3. Wait for the acknowledgement to complete before rebooting the FATBOX B.A.S.E

Your first call for support should be your local FATBOX solutions partner. If that fails to solve your problems or answer your queries, please contact us via support@amplified.com.au and we will get back to you latest the next business day.

Amplified Engineering Pty Ltd
Level 29 Perth Forrest Centre
221 St. Georges Terrace
Perth Western Australia 6000
AUSTRALIA

amplified.com.au

amplified.com.au